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A NEW SPECIES OF *HAEMAGOGUS*, *MESODENTATUS*, FROM COSTA RICA, AND A DESCRIPTION OF THE LARVA OF *HAEMAGOGUS ANASTASIONIS* DYAR (DIPTERA, CULICIDAE).

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During the course of a mosquito survey being conducted in the Republic of Costa Rica by the junior author, the larvae of a new species of *Haemagogus* were found in the water in a tree-hole in the Parque Bolivar, in San Jose, Costa Rica. A series of adults, males and females, were reared, and the associated larval skins were preserved. A description of the new species was drawn up from this material.

In the course of the same survey, *Haemagogus* larvae were found in the holy-water font of a church in Santa Cruz, province of Guanacaste, C. R. Males reared from these larvae showed that the species was *H. anastasionis* Dyar. As the larvae of this species have not been described, a description is here given.

DESCRIPTION OF ADULT FEMALE OF *Haemagogus mesodentatus*, n. sp.  
(HERE DESCRIBED.)

Head elongate, somewhat flattened dorso-ventrally.

Proboscis moderate, blue-black.

Palpi short, about one-sixth the length of the proboscis.

Antennae with tori black, with a few black setae.

Clypeus prominent, black, nude.

Vertex and occiput with blue-black scales; several long, strong setae projecting between the eyes; a narrow rim of white scales and several long black setae on dorsal margin of eyes; lower third of sides of head silvery white.

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<sup>1</sup>This paper, and subsequent articles which it is hoped to publish, are the products of the collaboration of two colleagues. The order of the names of the authors of the new species herein described is of no significance as regards seniority. In the next paper of the series, the names of the authors will be reversed in order of precedence. The "senior" author of this paper is Senior Sanitary Engineer, U. S. Public Health Service, and the "junior" author is a staff member of the International Health Division of the Rockefeller Foundation.

The studies and observations on which this paper is based were conducted with the support and under the auspices of the United States Public Health Service, the International Health Division of the Rockefeller Foundation, and the Gorgas Memorial Laboratory.

Anterior pronotum (prothoracic lobe) with blue-black scales and a few strong black setae dorsally. Proepisternum with silvery white scales.

Mesonotum of thorax clothed with overlapping elongate scales having golden and purple reflections in certain lights; a few white scales just before wing-bases. Scutellum trilobed, heavily clothed with projecting scales and many long, strong setae from each lobe. A line of closely spaced, long, strong setae above each wing-root, extending posteriorly towards scutellum. Pleura with sternopleuron sparsely covered with grayish white scales. Epimeron with silvery white scales. Setae present as follows: many short black setae on each side of anterior promontory of mesonotum, just dorsal to prothoracic lobes. Prespiracular setae present; one lower sternopleural seta; a few prealar setae; a patch of upper mesipimeral setae.

Halteres with stem dusky, knob black.

Postnotum black, shining, without setae.

Abdomen long, slender, tapering, exceeding the length of the wing. First abdominal segment with black setae projecting from posterior margin; sides with silvery white scales. Remainder of segments without setae, but clothed with metallic bluish scales on tergites. A small spot of silvery white scales laterally, on sixth tergite. Sternites usually concealed, except the seventh and eighth. Tergites with silvery white scales laterally on first four segments, the colors separated in a straight line; on the fifth sternite the edges are dark, with a white median incision. Cerci dark.

Legs bright metallic blue-black. Fore femur without white ventrally. Mid femur narrowly white-lined internally. Hind femur broadly white on ventral aspect nearly to tip. Apical half of first mid-tarsal segment, basal half of second, and sometimes the base of third, clothed with grayish white scales. Remainder of tarsi, and the tibiae, dark blue-black. Claws on fore and mid tarsi toothed; without teeth on hind tarsi.

Wings moderate, hyaline, clothed with narrow black scales on veins, denser on costa and first and second veins.

#### DESCRIPTION OF MALE TERMINALIA OF *Haemagogus mesodentatus*, n. sp.

Side-piece long, narrow, compressed; basal lobe small, rounded, projecting, with many fine setae, and a few much longer, flattened, tapering filaments, half as long as side-piece. Scales on inner distal margin of side-piece dense, alike, long, striate, broadly obovate, with very short pointed tips. No apical lobe, but a few long, curved setae just before tip of side-piece, on inner aspect. Outer aspect clothed with dense, long, striate, truncate-tipped scales, and long strong setae.

Clasper moderate, somewhat more than one-third the length of the side-piece, curved and somewhat enlarged at the middle. Terminal spine slightly subapical, slender, slightly swollen on basal third, curved and tapering beyond to a blunt point; spine about one-third as long as the clasper. Claspette with stem long, slightly sinuate in front view; in side-view, the outer third is bent at an angle of about 180 degrees with the stem; base somewhat swollen, then constricted before the angulation; a single strong seta on inner aspect, then

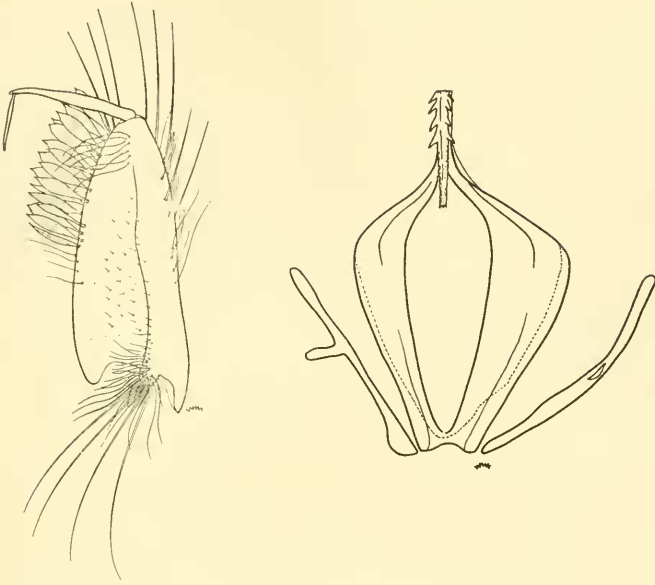


Fig. 1. *Haemogogus mesodentatus*, side piece and clasper of male.

Fig. 2. Mesosome of male of same, from a somewhat lateral aspect.

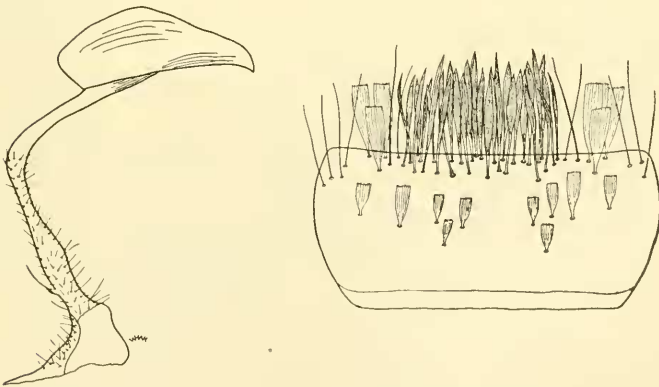


Fig. 3. *Haemogogus mesodentatus*, claspette and filament of male.

Fig. 4. *H. mesodentatus*, specialized scales on eighth abdominal tergite of male.

densely setose to angulation of stem, remainder bare to insertion of filament. Claspette filament in side-view a broad thin blade, nearly a half-circle in outline, striate, with a very small recurved tip.

Mesosome large, heavily chitinized, narrow at base, broadened into conspicuous shoulders distally, then tapering abruptly to a long, thin beak, with a slight tilt backwards; the tip of the beak forms a median carina, with about eight paired, coarse, curved serrations apically, and a number of finer ones basally. Body of mesosome with a large elliptical opening on dorsal face, into which the base of the median carina projects. Ventral face of mesosome widely open nearly to base.

Tenth sternites moderate, the tips chitinized, forming short, striate, oblique, hood-like structures, the outer angles projecting. Each sternite with 4 or 5 strong setae on outer aspect, below tip.

Ninth tergites poorly developed, but bearing one large curved seta apiece.

Eighth tergite bearing a patch of about 25 long, striate, obovate-lanccolate scales, two or three rows deep.

Type locality, San Jose, Costa Rica.

Type material, Holotype, male, allotype female, and 3 paratypes. To be deposited in the U. S. National Museum.

Type material reared from larvae found in a tree-hole in the Parque Bolivar, San Jose, Costa Rica, December 20, 1937, by Henry W. Kumm.

#### DESCRIPTION OF LARVA OF *Haemagogus mesodentatus*, n. sp.

Head rounded, the head-hairs well forward on the fronto-clypeus. Anterior and posterior head-hairs single; intermediate tufts long, in tufts of 6 or 7. Antec antennal tuft in 3 or 4. Antenna relatively short, scarcely tapering, with a single hair just beyond middle.

Integument of thorax and abdomen finely long-pilose.

Lateral scale-patch of eighth abdominal segment of about 10 long, pointed scales, not fringed at tip.

Siphon stout, about 3 to 3½ times as long as wide, with 12 to 15 very closely spaced spines, closely followed by a 2-haired tuft at apical third of siphon. Spines short, with a single tooth at base.

Anal segment with chitinous saddle large, extending well down sides. Posterior margin with about 6 very large spicules. Lateral hair double, long, strong. Ventral brush small, of about 10 bifid hairs. Two long simple caudal hairs, and a pair of 3-haired tufts.

Anal gills short, rounded, about as long as anal segment.

Remarks: *H. mesodentatus* is apparently closely related to *H. janthinomys* Dyar, of South America. The claws of the female are toothed in both species. The integument of the larva is pilose, as in *janthinomys*, but the pilosity of *mesodentatus* is much finer and sparser than that of *janthinomys*. The scales on

Haemagogus mesodentatus n. sp.

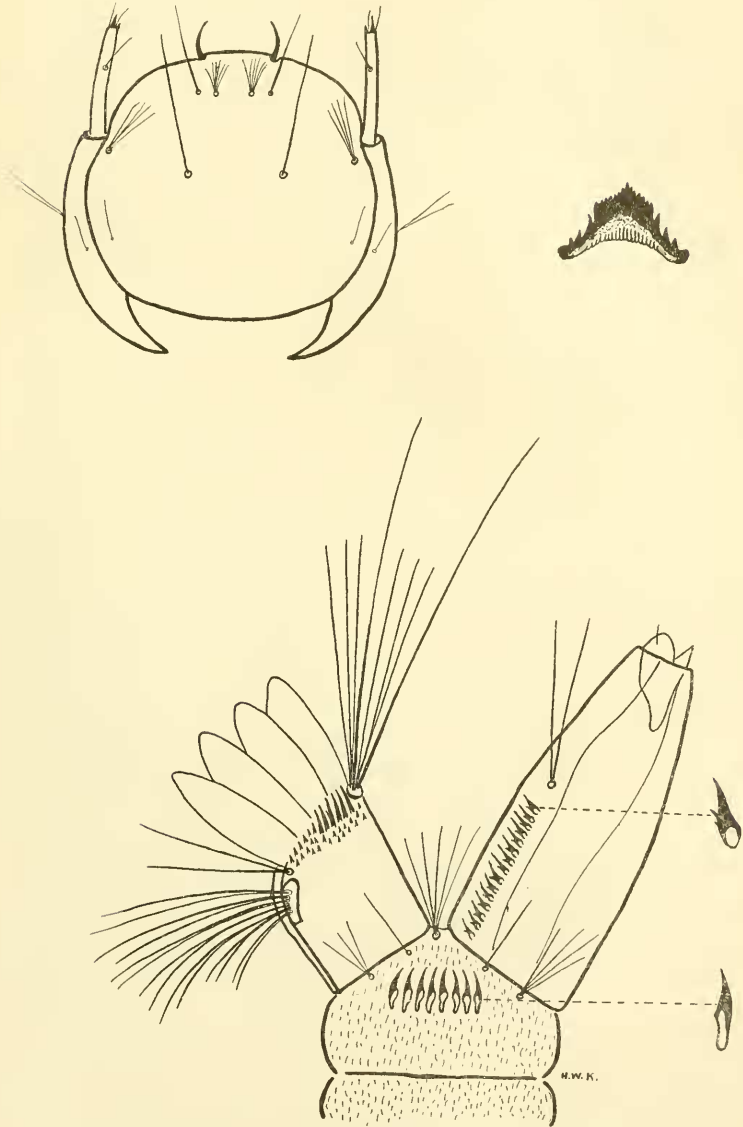


Fig. 5. Details of larva of *Haemagogus mesodentatus*, N. Sp.

Haemagogus anastasionis Dyar

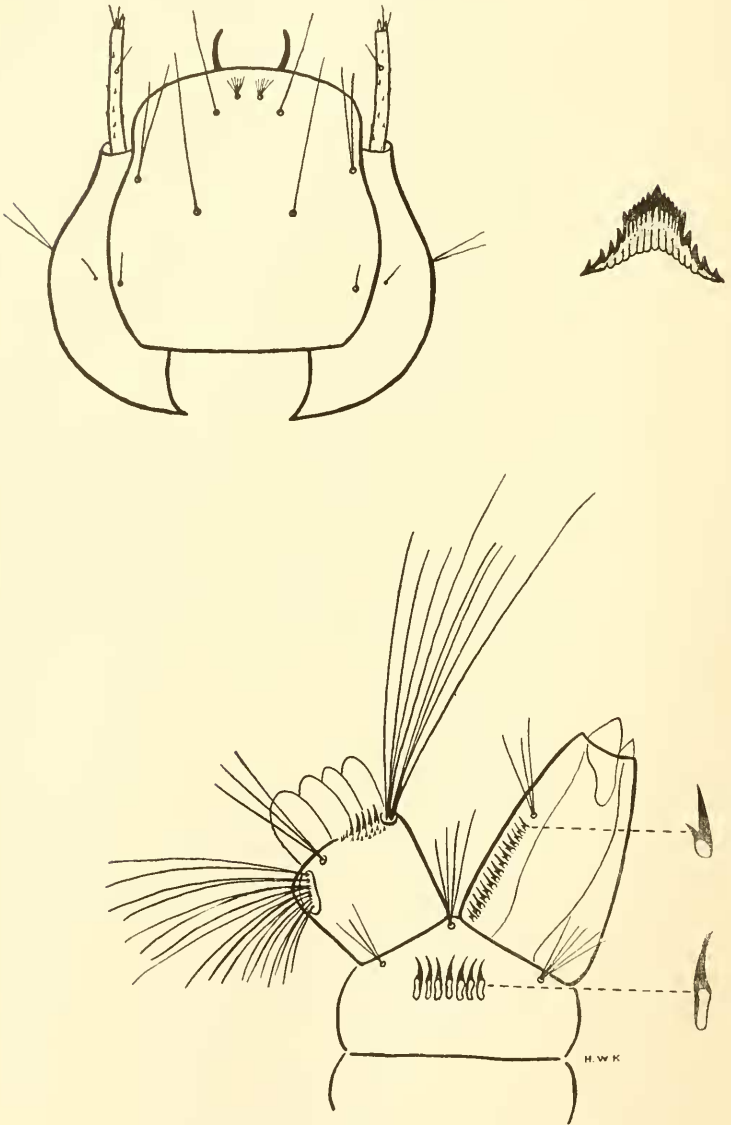


Fig. 6. Details of larva of *Haemagogus anastasionis* Dyar.

the eighth abdominal segment of *mesodentatus* larvae are free, but are attached to a plate in *janthinomys*. The appearance of the tip of the mesosome is similar in both species, but in *janthinomys* the tip is beaked, and the serrations are on the ventral surface, while in *mesodentatus* the tip is somewhat truncate, and the serrations are on a median carina on the dorsal surface. The filament of the claspette of *mesodentatus* is much wider than that of *janthinomys*, and the angle which the posterior outline makes with the stem of the claspette is much more obtuse than in *janthinomys*. In the adult female, the peculiar character of the grayish white scales on some of the mid-tarsal segments, if it is constant, should be a good distinguishing character.

#### DESCRIPTION OF LARVA OF *Haemagogus anastasionis* Dyar.

Head rounded, the head-hairs well forward on the fronto-clypeus. Anterior and posterior head-hairs single, the anterior hairs somewhat closer together than the posterior hairs. Intermediate tufts long, in 5 or 6. Ant antennal tuft long, strong, in 2 or 3.

Antenna moderate, slightly tapering, smooth, with a 1- or 2-haired tuft just beyond middle.

Integument of thorax and abdomen glabrous.

Lateral scale-patch of 8th abdominal segment of 6 to 10 scales; each scale very long, slender, sharply pointed, with the tip very finely fringed (visible at 400 X magnification), curved, slender, somewhat longer than the base.

Siphon stout, slightly tapering, with 12 to 16 closely spaced spines, reaching middle of siphon, closely followed by a long 2- or 3-haired tuft; each spine short, with a short tooth near base; a few spines may have a number of teeth on inner aspect, between large tooth and base of spine.

Anal segment with chitinous saddle large, extending well down sides; posterior margin with 6 or 7 very stout, long spicules. Lateral hair in 3 or 4, long, slender. Ventral brush of about 10 hairs, not extending beyond barred area, the most dorsal hair in 4 or 5, the most ventral double or triple. Two long simple caudal hairs, and a pair of 3- or 4-haired tufts. Anal gills short, rounded, unequal, the ventral pair half the length of the dorsal pair.

Remarks: The larvae were found in a holy-water font in a church at Santa Cruz, province of Guanacaste, Costa Rica, December 20, 1937. Dr. H. W. Kumm, collector. Adult males and females were reared from these larvae, which correspond to the published description of this species, and with the original material from Costa Rica now in the U. S.

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